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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/935,804 | 08/23/2001 | Niels Christiansen | P/772-299 | 9590 |

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[REDACTED] EXAMINER

FORTUNA, ANA M

| ART UNIT | PAPER NUMBER |
|----------|--------------|
| J723 | 4 |

DATE MAILED: 04/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

| | | |
|----------|-----------------|--------------------|
| | Application No. | Applicant(s) |
| | 09/935,804 | Christiansen et al |
| Examiner | Ana Fortuna | Art Unit 1723 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on Aug 23, 2001.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.
- 4) Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-6 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s). <u>2</u> | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Claim Rejections - 35 U.S.C. § 112

1. Claims 2 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 2 is unclear as to what is intended. Claim 2 should refer to the list of metal oxides as alternative or as selected from a Markush group, and not in a table form, e.g. TiO₂, Zr₂ or WO₃; or e.g. selected from the group consisting of TiO₂, ZrO₂, and WO₃. Claim 6 is unclear as to the Zeta potential of the membrane, as a property of the membrane. Defining the membrane property as depending on an intended use of the membrane in the system is confusing, since the allowability of the system is determined based on the system structure, therefore, for examination purpose the system is considered as consisting at least one porous ceramic metal oxide membrane, a pump, and the membrane having a Zeta potential, e.g. charged membrane.

Claim Rejections - 35 U.S.C. § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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3. Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by Gan et al.(Beer Clarification by Cross-flow Microfiltration). Gan et al discloses the system including a pump and a ceramic membrane, or aluminum oxide membrane (alumina) (Fig. A, page 4, column 1, or entire article). The charge of Zeta potential in alumina (aluminum oxide) seems to be inherent of the membrane material.
4. Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by GB 2176715A(hereinafter '715). The apparatus or system as claimed is disclosed in '715 (Fig. 1). The membrane is disclosed as a ceramic membrane, e.g. aluminum oxide (sintered alumina) is also disclosed in the reference. The Zeta potential is not discussed in the reference, however, seem to be inherent of the membrane material.

Claim Rejections - 35 U.S.C. § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burrel et al (Crossflow Microfiltration of Beer; Laboratory-Scale Studies on the Effect of Pore Size), or Burrel et al in view of Goldsmith et al (5,114,581). Burrel et al discloses the process of filtering beer with Ceramem Ceramic membranes, the membrane consists of a thin ceramic layer on an

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extruded support (abstract, columns 1-2, page 399). As to claims 3-4, the process is a Crossflow filtration process, and removal of yeast and haze forming colloids is also disclosed (page 399, column 1, paragraphs 1-4). As to claim 2, Burrel et al fails to disclose in detail the ceramic composition or the membranes made of titanium oxide, zirconium oxide, etc., Burrel et al teaches the membrane as "Ceramic" and further a composite, having support and layer of ceramic material and made by Ceramem Corporation, and illustration of the membrane having channels and monolithic structure is also disclosed (Fig. 1). The membranes as disclosed by Burrel et al are known in the art as made from ceramic materials including zirconia, titania, alumina (oxides), etc. In both the support and the membrane layer. It would have been obvious to one skilled in the art at the time the invention was made to use a membrane of zirconia, titania, or alumina in the process of the present invention as the Ceramem Membrane for the beer filtration or yeast removal from the suspension. The pH and Zeta potential factors are not disclosed by Burrel et al, however, this property seems to be inherent of the particular ceramic materials claimed, which are not detailed. By Burrel et al, but incorporated by reference by referring to Ceramen membranes having the composite ceramic and monolithic structure disclosed (column 1, last paragraph and column 2, page 399). Regarding claim 6, the apparatus structure including the membrane for Crossflow operation is also disclosed (Fig. 2).

Goldsmith et al. ('581) discloses the membrane module made of ceramic support and ceramic layer (Ceramem Corporation membrane) which inherently possesses the Z potential and properties claimed, the membrane and support are made from zirconia, titania, alumina, etc. (Abstract,

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Figures, column 2, lines 37, and 48-58, column 4, last paragraph, though column 5, lines 1-23); the use of the membrane for liquid filtration and removal of particulate matter of a few particle size from a few micron down to submicron size (column 2, lines 19-22). It would have been obvious to one skilled in the art at the time the invention was made to use the Ceramem membrane disclosed by Goldsmith et al in a process of filtering beer or wine or fermented beverage, as disclosed in Burrel et al., since the membrane possesses the properties required in the process of Burrel, discloses the ceramic materials which inherently possesses the Zeta potential and polarities at given pH as required in the present invention. As to claim 1, the pH value of fermented beer is known to be about 7. Filtering beer from a fermentation process and the fermentation pH, to remove yeast and colloids it would have been obvious to one skilled in the art at the time the invention was made, based on Burrel et al teaching

7. Claims 1, 2, 3, are rejected under 35 U.S.C. 103(a) as being unpatentable over Galaj et al 94,946,592)(hereinafter '591). Reference '591 discloses a membrane composite made of ceramic or metal oxides, including the oxides claimed in claim 2, the membrane is a microfiltration membrane and is suggested for the separation or clarification of suspensions, e.g. wine, beer, cider, and alcoholic fermentation liquors (column 1, lines 32-52, column 2, lines 45-68). The membrane can be shaped in tubular form, in which a Crossflow filtration can be performed (column 8, lines 22-28). The pH, and the membrane potential are not disclosed in reference '592. Since the membrane is made from the same materials as the current membrane, and suggested for the same use, e.g. wine, beer, and alcoholic fermentation broth, one skilled in the art at the time

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the invention was made would have expected the same membrane performance e.g. Zeta potential and pH adjustment for the membrane at a particular pH conditions of the suspension, based on the membrane materials, e.g. for both membranes made of the same composition and pore size, and subjected to the same filtration process, e.g. wine filtration at a given pH, the membrane is expected to show the same performance.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Reference 0645174A1 teaches removing components causing turbidity, from beer, wine, juice, etc. by microfiltration. References 4,781,831, 6,126,833, 5,009,781, and 5,108,601 are cited as membranes made on ceramic support and made by Ceramen Corporation.. Reference 5,221,479 teaches filtering suspensions having yeast, and beer filtration through a microfilter membrane (column 8, lines 28-46), the pH of the medium and beer filtration is disclosed in column 11-12, examples 1 and 2).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ana Fortuna whose telephone number is (703) 308-3857. The examiner can normally be reached on Monday-Friday from 9:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda Walker, can be reached on (703) 308-0457. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9310 for regular responses, and (703)872-9311 for after finals.

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Ana Fortuna

April 21, 2003

ANA FORTUNA
PRIMARY EXAMINER



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PRIMARY EXAMINER